REMARKS/ARGUMENTS

Claims 1-26 are pending in the present application. Reconsideration of the claims is respectfully requested.

I. Application to be Considered Special

This application has received a **fifth**, non-final Office Action. As per MPEP § 707.02, Applicants respectfully request that the Supervisory Patent Examiner personally check on the pendency of this application and make every effort to complete prosecution of this application.

II. 35 U.S.C. § 102, Alleged Anticipation

The Office rejects claims 1-26 under 35 U.S.C. § 102(b) as being anticipated by Preboot Execution Environment (PXE) Specification, Version 2.1, Intel Corporation, September 20, 1999, (hereinafter PXE). This rejection is respectfully traversed.

A prior art reference anticipates the claimed invention under 35 U.S.C. § 102 only if every element of a claimed invention is identically shown in that single reference, arranged as they are in the claims. *In re Bond*, 910 F.2d 831, 832, 15 U.S.P.Q.2d 1566, 1567 (Fed Cir. 1990). All limitations of the claimed invention must be considered when determining patentability. *In re Lowry*, 32 F.3d 1579, 1582, 32 U.S.P.Q.2d 1031, 1034 (Fed Cir. 1994). Anticipation focuses on whether a claim reads on the product or process a prior art reference discloses, not on what the reference broadly teaches. *Kalman v. Kimberly-Clark Corp.*, 713 F.2d 760, 218 U.S.P.Q. 781 (Fed. Cir. 1983). Applicants respectfully submit that PXE does not teach every element of the claimed invention arranged as they are in the claims. Specifically, PXE does not teach receiving at the client a boot server list if the client configuration information is not found on the first boot server and sending from the client a configuration information request for the client configuration information to each server in the boot server list until the client configuration information is found or a request has been sent to every server in the boot server list.

PXE is directed to ensuring that client systems in their enterprises can boot appropriate software images using appropriate configuration parameters. These selected boot images and configuration parameters are acquired from selected servers in the enterprise as dictated by the needs of the particular environment, the capabilities or mission of the user, the resources available within the client, etc. Furthermore, the clients described by PXE should boot consistently and in an interoperable manner regardless of the sources or vendors of the software and the hardware of both client and server machines.

The Office alleges that PXE teaches receiving at the client a boot server list if the client configuration information is not found on the first boot server at pages 10-11 and Figure 2-4 on page 18, which reads as follows:

> 1.5 Overview
> 1.5.1 PXE Protocol
> PXE is defined on a foundation of industry-standard Internet protocols and services that are widely deployed in the industry, namely TCP/IP, DHCP, and TFTP. These standardize the form of the interactions between clients and servers. To ensure that the meaning of the client-server interaction is standardized as well, certain vendor option fields in DHCP protocol are used, which are allowed by the DHCP standard. The operations of standard DHCP and/or BOOTP servers (that serve up IP addresses and/or NBPs) will not be disrupted by the use of the extended protocol. Clients and servers that are aware of these extensions will recognize and use this information, and those that do not recognize the extensions will ignore them.
> In brief, the PXE protocol operates as follows. The client initiates the protocol by broadcasting a DHCPDISCOVER containing an extension that identifies the request as coming from a client that implements the PXE protocol. Assuming that a DHCP server or a Proxy DHCP server implementing this extended protocol is available, after several intermediate steps, the server sends the client a list of appropriate Boot Servers. The client then discovers a Boot Server of the type selected and receives the name of an executable file on the chosen Boot Server. The client uses TFTP to download the executable from the Boot Server. Finally, the client initiates execution of the downloaded image. At this point, the client's state must meet certain requirements that provide a predictable execution environment for the image. Important aspects of this environment include the availability of certain areas of the client's main memory, and the availability of basic network I/O services.
> 1.5.1.1 Deployment of servers
> On the server end of the client-server interaction there must be available services that are responsible for providing redirection of the client to an appropriate Boot Server. These redirection services may be deployed in two ways:
> 1. Combined standard DHCP and redirection services. The DHCP servers that are supplying IP addresses to clients are modified to become, or are replaced by servers that serve up IP addresses for all clients and redirect PXE-enabled clients to Boot Servers as requested.
> 2. Separate standard DHCP and redirection services. PXE redirection servers (Proxy DHCP servers) are added to the existing network environment. They respond only to PXE-enabled clients, and provide only redirection to Boot Servers.
>
> Each PXE Boot Server must have one or more executables appropriate to the clients that it serves.
> 1.5.1.2 Deployment of Clients
> PXE does not specify the operational details and functionality of the NBP that the client receives from the server. However, the intent is that running this executable will result in the system's being ready for use by its user. At a minimum, this means installing an operating system, drivers, and software appropriate to the client's hardware configuration. It might also include user-specific system configuration and application installation.

PXE specifies the protocols by which a client requests and downloads an executable image from a Boot Server and the minimum requirements on the client execution environment when the downloaded image is executed.

1.5.2 PXE APIs

To enable the interoperability of clients and downloaded bootstrap programs, the client PXE code provides a set of services for use by the BIOS or a downloaded NBP. The API services provided by PXE for use by the BIOS or NBP are:

- Preboot Services API. Contains several global control and information functions.
- Trivial File Transport Protocol (TFTP) API. Enables opening and closing of TFTP connections, and reading packets from and writing packets to a TFTP connection.
- User Datagram Protocol (UDP) API. Enables opening and closing UDP connections, and reading packets from and writing packets to a UDP connection.
- Universal Network Driver Interface (UNDI) API. Enables basic control of and I/O through the client's network interface device. This allows the use of universal protocol drivers such that the same universal driver can be used on any network interface that implements this API.

The following diagram illustrates the relationship between the NBP (the remote boot program) and the PXE APIs.

(Page 10-11)

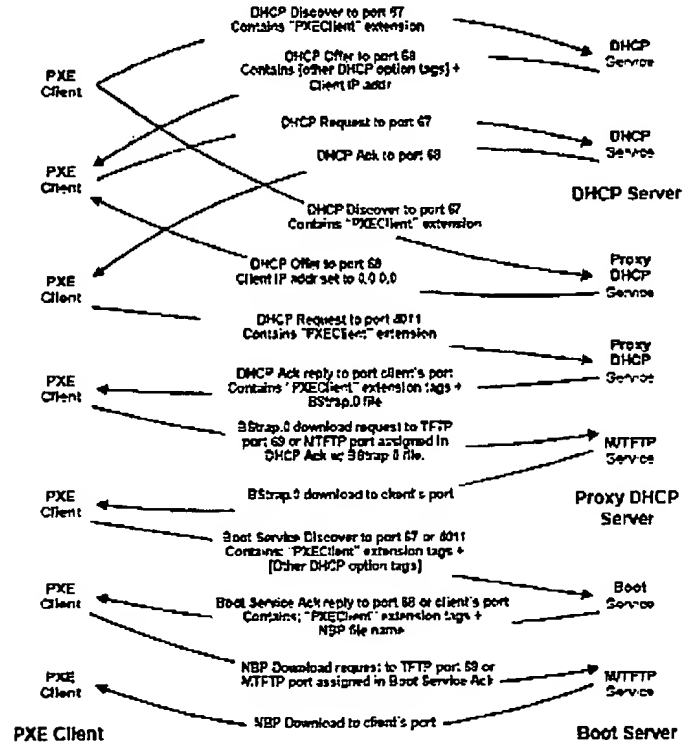

Figure 2-4 PXE Client Response to DHCP Server Supplying Boot Service Discovery Code

(Page 18, Figure 2-4)

In these cited sections and Figure 2-4, PXE describes a client broadcasting a DHCPDISCOVER message to the standard DHCP port (67) to a DHCP server and a Proxy DHCP server. The DHCP or Proxy DHCP Service responds by sending a DHCPOFFER message to the client on the standard DHCP reply port (68). At this point, other DHCP Services and BOOTP Services also respond with DHCP offers or BOOTP reply messages to port (68). Each message contains standard DHCP parameters. From the DHCPOFFER(s) that it receives, the client records the following:

- The Client IP address (and other parameters) offered by a standard DHCP or BOOTP Service.
- The Boot Server list from the Boot Server field in the PXE tags from the DHCPOFFER.
- The Discovery Control Options (if provided).
- The Multicast Discovery IP address (if provided).

Then, the client selects an IP address offered by a DHCP Service, and the client must complete the standard DHCP protocol by sending a request for the address back to the Service and then waiting for an acknowledgment from the Service. If the client selects an IP address from a BOOTP reply, it can simply use the address. Then the client selects and discovers a Boot Server. The Boot Server unicasts a DHCPACK packet back to the client on the client source port with the client configuration.

Thus, PXE describes a client sending a message to a DHCP server and a Proxy DHCP and the **DHCP server** and/or a **Proxy DHCP server** responding with a DHCPOffer **which includes a boot server list**. Thus, the DHCP server and/or a Proxy DHCP server responds to the client with the boot list in response to a DHCPDISCOVER message sent by the client. The boot list is not sent by the DHCP server and/or Proxy DHCP server in response to the client configuration information not being found on the first boot server. Moreover, PXE would have no need for providing or incorporating such a feature. PXE states "Each PXE Boot Server must have one or more executables appropriate to the clients that it serves." (see page 10, last sentence) Thus, the PXE client would have no need to receive a boot server list if the client configuration information is not found on the first boot server, because PXE provides that each PXE Boot Server **must** have one or more executables appropriate to the clients that it serves.

Additionally, PXE does not teach sending from the client a configuration information request for the client configuration information to each server in the boot server list until the client configuration information is found or a request has been sent to every server in the boot server list. The Office alleges that this feature is taught at pages 10-18 and Figure 2-4 on page 18. As discussed above, PXE describes that each PXE Boot Server **must** have one or more executables appropriate to the clients that it serves. Thus, there is no need for PXE to send a client configuration to more than one boot server as each boot server has one or more executables appropriate to the clients that it serves.

Independent claims 10, 21, and 26 recite similar features in their respective claim terminology. For example, claim 10, which is representative of the other rejected independent claims 21 and 26 with

regard so similarly recited subject matter, recites "receiving at a boot server an initial request for client configuration information from a client, wherein the initial request is initiated at a client and **sending from the boot server the boot server list to the client if the client configuration information is not found.**"

Thus, PXE does not teach each and every feature of independent claims 1, 10, 14, 21, 25, and 26 as is required for a rejection under 35 U.S.C. § 102. At least by virtue of their dependency on independent claims 1, 10, 14, and 21, the specific features of dependent claims 2-9, 11-13, 15-20, and 22-24 are not taught by PXE. Accordingly, Applicants respectfully request withdrawal of the rejection of claims 1-26 under 35 U.S.C. § 102.

Furthermore, PXE does not teach, suggest, or give any incentive to make the needed changes to reach the presently claimed invention. Absent the Examiner pointing out some teaching or incentive to implement PXE such that a client a boot server list is received if the client configuration information is not found on the first boot server and a client sends a configuration information request for the client configuration information to each server in the boot server list until the client configuration information is found or a request has been sent to every server in the boot server list, one of ordinary skill in the art would not be led to modify PXE to reach the present invention when the reference is examined as a whole. Absent some teaching, suggestion, or incentive to modify PXE in this manner, the presently claimed invention can be reached only through an improper use of hindsight using the Applicants' disclosure as a template to make the necessary changes to reach the claimed invention.

Moreover, in addition to their dependency from independent claims 1, 10, 14, and 21, the specific features recited in dependent claims 2-9, 11-13, 15-20, and 22-24 are not taught by PXE. For example, with regard to claims 3 and 16, PXE does not teach receiving, from the first boot server, an error message that indicates that the client information is not found on the first boot server. The Office alleges that this feature is taught at pages 31-32. While this section may mention an error recovery phase that the client may enter at any time, there is no teaching whatsoever of an error message being received from the first boot server that indicates that the client information is not found on the first boot server. Moreover, as discussed above, PXE provides that each PXE Boot Server **must** have one or more executables appropriate to the clients that it serves. Therefore, there is no need for PXE to provide such a feature.

With regard to claims 4 and 17, PXE does not teach receiving the client configuration information from an associated boot server in response to the client configuration information being found. As discussed above, PXE does not need to provide for an instance where a request for a configuration file needs to be sent to an associated boot server in response to client configuration no being found on a first boot server and thus receiving the client configuration information from an associated boot server in

response to the client configuration information being found. That is, PXE provides for each PXE Boot Server have one or more executables appropriate to the clients that it serves.

With regard to claims 6 and 18, PXE does not teach determining whether the entries in the boot server list were pre-ordered, in order to better support load balancing among boot servers, prior to transmission to the client and, if the list is found to be ordered, sending a configuration information request for the client configuration information to each server in the boot server list in the order given. The Office alleges that these features are taught on page 10, shown above. Nowhere in this section, or any other section of PXE, does the term "load balancing" appear. Moreover, PXE describes sending a boot server list to the client from the DHCP server or Proxy DHCP server. The client then discovers a boot server and requests client configuration with the understanding that each PXE Boot Server **must** have one or more executables appropriate to the clients that it serves.

With regard to claims 7 and 19, PXE does not teach sending a configuration information request for the client configuration information to each server in the boot server list in order of increasing network distance, where distance is estimated from available network configuration information when there was no indication that the order of the original boot server list was optimized in order to better support load balancing. The Office alleges that these features are taught on pages 10-11, shown above. Nowhere in this section, or any other section of PXE, does the term "distance" appear. Moreover, PXE describes sending a boot server list to the client from the DHCP server or Proxy DHCP server. The client then discovers a boot server and requests client configuration with the understanding that each PXE Boot Server **must** have one or more executables appropriate to the clients that it serves. There would be no need for PXE to provide a boot server list that is ordered by increasing network distance.

With regard to claims 12 and 23, PXE does not teach adding an indication to the boot server list to inform the client that the list is being provided in optimal order to support load balancing among boot servers. The Office alleges that these features are taught on page 10, shown above. Nowhere in this section, or any other section of PXE, does the term "load balancing" appear. Moreover, PXE describes sending a boot server list to the client from the DHCP server or Proxy DHCP server. The client then discovers a boot server and requests client configuration with the understanding that each PXE Boot Server **must** have one or more executables appropriate to the clients that it serves.

Thus, in addition to being dependent on independent claims 1, 10, 14, and 21, the specific features of dependent claims 2-9, 11-13, 15-20, and 22-24 are also distinguishable over PXE by virtue of the specific features recited in these claims. Accordingly, Applicants respectfully request withdrawal of the rejection of dependent claims 2-9, 11-13, 15-20, and 22-24 under 35 U.S.C. § 102.

III. Conclusion

It is respectfully urged that the subject application is patentable over the prior art of record and is now in condition for allowance. The Examiner is invited to call the undersigned at the below-listed telephone number if in the opinion of the Examiner such a telephone conference would expedite or aid the prosecution and examination of this application.

Respectfully submitted,

DATE: May 19, 2006

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